

CLAIMS

1. A 2D/3D switching type liquid crystal display panel capable of 2D display and 3D display, comprising: display image generating means for generating an image in accordance with input image data; parallax barrier means for rendering a certain viewing angle to a display image during 3D display, so as to provide a 3D effect; and switching means for switching 2D display and 3D display by activating and deactivating the effect of the parallax barrier means,

the parallax barrier means and the switching means respectively having wider active areas than an active area of the display image generating means.

2. The 2D/3D switching type liquid crystal display panel as set forth in Claim 1, wherein:

one of the active areas of the parallax barrier means and the switching means farther away from the active area of the display image generating means has a wider area.

3. The 2D/3D switching type liquid crystal display panel as set forth in Claim 1, wherein:

$$d1 \geq t1 \cdot \tan\theta1, \text{ and } d2 \geq t2 \cdot \tan\theta1$$

are satisfied, where $d1$ is a widthwise protruding

amount from an end portion of the active area of the display image generating means to an end portion of the active area of the parallax barrier means and, d_2 is a widthwise protrusion amount from the end portion of the active area of the display image generating means to an end portion of the active area of the switching means, t_1 is a distance, in a panel thickness direction, between the active area of the parallax barrier means and the active area of the display image generating means, and t_2 is a distance, in the panel thickness direction, between the active area of the switching means and the active area of the display image generating means, and θ_1 is a viewing angle secured by the display image generating means the 2D/3D switching type liquid crystal.

4. The 2D/3D switching type liquid crystal display panel as set forth in Claim 1, wherein:

the parallax barrier means is constituted of (i) a patterned retardation plate in which two optical regions with different retardation axis directions are patterned alternately in a stripe manner, and (ii) a parallax barrier polarizer whose transmission axis is fixed in one direction, and

the display image generating means, the patterned retardation plate, and the switching means are disposed

in this order.

5. The 2D/3D switching type liquid crystal display panel as set forth in Claim 1, wherein:

the parallax barrier means is constituted of (i) a patterned retardation plate in which two optical regions with different retardation axis directions are patterned alternately in a stripe manner, and (ii) a parallax barrier polarizer whose transmission axis is fixed in one direction,

the switching means is constituted of a liquid crystal panel for switching, between ON and OFF of an applied voltage, an optical modulation effect on light passing through the switching means, and

in 2D display, the light passing the switching means is affected by two optical areas of the patterned retardation plate to pass through the parallax barrier polarizer at the same transmittance, and in 3D display, the light passing the switching means is affected by the optical areas of the patterned retardation plate to pass through the parallax barrier polarizer at the different transmittances.

6. The 2D/3D switching type liquid crystal display panel as set forth in Claim 1, wherein:

the display image generating means is provided as a display liquid crystal panel that has two substrates between which a display liquid crystal layer is sandwiched, and that is able to generate a display image for each of 2D display and 3D display,

the parallax barrier means is provided as a patterned retardation plate that is obtained by providing, on a substrate, a patterned liquid crystal layer aligned in a specific pattern, and that renders a certain viewing angle to an image for 3D display,

the switching means is provided as a switching liquid crystal panel that has two substrates between which a switching liquid crystal layer is sandwiched, and that switches between 2D display and 3D display by activating and deactivating the effect of the parallax barrier of the patterned retardation plate, and

the display liquid crystal panel and the switching liquid crystal panel are provided such that a terminal formation portion of the display liquid crystal panel and a terminal formation portion of the switching liquid crystal panel are on a same side of the 2D/3D switching type liquid crystal display panel.

7. The 2D/3D switching type liquid crystal display panel as set forth in Claim 6, wherein:

the terminal formation portion of the display liquid crystal panel is provided on one of two substrates of the display liquid crystal panel, and the terminal formation portion of the switching liquid crystal panel is provided on one of two substrates of the switching liquid crystal panel, and the display liquid crystal panel and the switching liquid crystal panel are disposed face to face so that the substrates respectively having the terminal formation portions face each other.

8. The 2D/3D switching type liquid crystal display panel as set forth in Claim 6, wherein:

the display liquid crystal panel and the switching liquid crystal panel are disposed face to face so that a larger of the two substrates of the display panel faces a larger of the two substrates of the switching liquid crystal panel.

9. The 2D/3D switching type liquid crystal display panel as set forth in Claim 1, wherein

the display image generating means is provided as a display liquid crystal panel that has two substrates between which a display liquid crystal layer is sandwiched, and that is able to generate a display image for each of 2D display and 3D display,

the parallax barrier means and the switching means are provided as a switching liquid crystal panel, the switching liquid crystal panel having two substrates between which a switching liquid crystal layer is sandwiched, and a specific pattern, and

the display liquid crystal panel and the switching liquid crystal panel are disposed such that a terminal formation portion of the display liquid crystal panel and a terminal formation portion of the switching liquid crystal panel are on a same side of the 2D/3D switching type liquid crystal display panel.

10. The 2D/3D switching type liquid crystal display panel as set forth in Claim 9, wherein:

the terminal formation portion of the display liquid crystal panel is provided on one of two substrates of the display liquid crystal panel, and the terminal formation portion of the switching liquid crystal panel is provided on one of two substrates of the switching liquid crystal panel, and the display liquid crystal panel and the switching liquid crystal panel are disposed face to face so that the substrates respectively having the terminal formation portions face each other.

11. The 2D/3D switching type liquid crystal display

panel as set forth in Claim 9, wherein:

the display liquid crystal panel and the switching liquid crystal panel are disposed face to face so that a larger of the two substrates of the display panel faces a larger of the two substrates of the switching liquid crystal panel.

12. A 2D/3D switching type liquid crystal display device, comprising: a 2D/3D switching type liquid crystal display panel capable of 2D display and 3D display, the 2D/3D switching type liquid crystal display panel including: display image generating means for generating an image in accordance with input image data; parallax barrier means for rendering a certain viewing angle to a display image during 3D display, so as to provide a 3D effect; and switching means for switching 2D display and 3D display by activating and deactivating the effect of the parallax barrier means,

the parallax barrier means and the switching means respectively having wider active areas than an active area of the display image generating means.

13. (ADDED) A liquid crystal display panel, comprising: (i) display image generating means for

generating two display images in accordance with input image data; (ii) parallax barrier means for separating the display images to have different viewing angles; and (iii) switching means for switching the effect of the parallax barrier means to be activated or deactivated,

the parallax barrier means and the switching means having wider active areas than an active area of the display image generating means.

14. (ADDED) A liquid crystal display device comprising a liquid crystal panel including: (i) display image generating means for generating two display images in accordance with input image data; (ii) parallax barrier means for separating the display images to have different viewing angles; and (iii) switching means for switching the effect of the parallax barrier means to be activated or deactivated,

the parallax barrier means and the switching means having wider active areas than an active area of the display image generating means.

ATTACHMENT